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ABSTRACT

The continuing growth of computer understanding and use by educators makes it imperative for elementary school principals to become computer literate. Teachers' knowledge and skills relating to computers are increasing; computer costs are declining and computers becoming more readily available; software is improving in response to demand; and the microcomputer is making its presence felt as an effective teaching tool. To be able to respond to the school's increasing use of and need to use computers, principals must have a basic working understanding of both the school's computer hardware and the software that is available for that hardware. The principal should be able to assess such factors as hardware costs, capacities, and uses, and software's availability, compatibility with hardware, quality, and relevance to educational or administrative goals. Principals should read at least one computer education journal regularly to keep up on developments in the field. With computer literacy, principals can increase their control of budgeting, office administration, and instructional leadership. (PGD)

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MINIMUM COMPUTER KNOWLEDGE for ELEMENTARY PRINCIPALS

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Joint Educational Council Conference

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An elementary principal can no longer remain computer ignorant. Although they need not be computer experts, all principals need some knowledge of hardware, software, computer assisted instruction (CAI), and microbased administrative operations.

While teachers are working hard to learn how to utilize microcomputers in and outside of their classrooms, many principals have failed to keep up and do not offer the support teachers need. By 1988 the typical elementary school will have 25 micros. The K-12 national computer-student ratio will be 1 to 25. Nor is this a suburban phenomenon. According to a recent report issued by the National Commission for Employment Policy, microcomputers are now used more in rural than urban areas.

Perhaps I can illustrate the need with a few anecdotes drawn from real life situations.

The central office has just released a publication reporting Metropolitan Achievement Test scores by grade and school for all schools in the district. My median scores at each grade level, one through five, are the lowest in the district. A small but vocal group of parents has called the school office demanding a conference. It is scheduled two days hence.

I think I know the phenomena behind our poor showing on the tests, but I need some hard data to support my explanation.

I call the school system's data processing unit. The data processing

EA 018 085

unit is well organized, efficient, and sympathetic. One week later a thirty page printout is delivered. It contains all the information I requested and more, much more. The data is arranged alphabetically from A to Z -- 800 names. I paper an entire wall with the relevant twenty-five pages and direct my forty teachers to come to the office "at their convenience" to copy test scores for their classes.

A few teachers who have special education or bilingual aides assigned to their rooms respond. Clipboard in hand, they search the wall, straining their eyes for the names of their thirty students. Dropped students' names appear on the list. Many recent enrollees are not listed. A half-hour search produces seventy-five percent of the currently enrolled students. Data for the missing twenty-five percent must be found elsewhere. When they complete the job the teachers must find a calculator to determine mean test scores. But most teachers will not be able to schedule an office visit until next week. Meanwhile, parents, salespeople, anyone can peruse the entire school list.

Despite everyone's good intentions, the principal's problem is not solved. He needs accurate and complete data--NOW!

If the principal had been more familiar with micro-based administrative software, he might have installed TELOSCHOOL, a simple, easy-to-use database program designed specifically for elementary school recordkeeping. This prepackaged database system (requires 48K Apple II Plus or IIe; two disk drives and printer) is designed specifically for elementary schools. If the principal had been using TELOSCHOOL, he could have produced up-to-date printouts of alphabetized classroom lists with test scores and appropriate averages for each teacher in under two hours. No office visit scheduling hassle, no eye strain, no breaches of information security, and no frazzled

nerves. A clerk, trained in a four-hour workshop, would generate reports responding precisely to the questions asked. Moreover, with little additional work the principal could correlate Metropolitan test scores with DRP's (Degrees of Reading Power), each student's primary language, school attendance for the year, and the number of schools the student had attended. A list of dropped students could be created, together with the names of students who had enrolled in the school since September. The principal could respond immediately to the parents' questions.

This is but one example of a situation in which a little knowledge of micocromputers and available software can make the principal's job easier and more effective.

Seventy percent of micros in schools are Apples. (How many people here have at least <u>one</u> Apple available in their school?) This particular piece of software is currently sold by Houghton Mifflin for $198. (It came on the market two years ago for $500.) The package includes an excellent training manual and sample data disk. A person familiar with computers can master it in four to six hours. Learning how to use an Apple II series computer from scratch might take a like amount of time. With 12 to 18 hours of classwork or self-instruction, a principal can master at least one significant micro-based administrative program which will utimately save hundreds of hours of administrative and secretarial time. (I shall be happy to talk after the meeting with people who would like to learn more about <u>TELOSCHOOL</u>.)

Recently I attended a meeting where a newly appointed superintendent asked 80 math teachers drawn from grades K-12 what they felt were the greatest obstacles hampering teaching effectiveness. High on the list was a lack of principal support for the use of technology in the classroom. One teacher said, "While teachers are working hard to learn how to use

computers effectively in the classroom, many principals have failed to keep up and do not offer the support teachers need to secure essential funding."

The response was not unexpected. Nor should it be considered condemnatory. It is an expression of logical educational development which has occurred over the past five years.

The use of microcomputers in education has been a grass roots movement. In many ways it parallels the growth of the industry itself. The story of Steven Jobs and Steven Wozniak working out of a garage ten years ago is already an American business legend. Two college dropouts create a two billion dollar company. Two electronic tinkerers, one a creative genius (Wozniak) and the other an entrepreneur (Jobs), have a vision of an affordable computer for the common man, and make that vision a reality.

The idea did not come from corporate America - IBM, AT & T, or Xerox corporation. They followed Apple (and Atari, Commodore, and Radio Shack) into the personal computer business, several years later. The industry grew from the grass roots (in this case a garage) up, not from CEO's in penthouse offices down. Only after a market for personal computers was well established did Fortune 500 companies enter the arena.

And so it has been with the use of personal computers in education. It wasn't superintendents, school boards, or principals who saw a place for micros in the classroom, and eventually in the principal's office. It was teachers, frequently collaborating with parents. High ranking school administrators and school boards recognized the need for IBM and Digital Equipment Corporation mainframes with technical experts to run them in the central office, and sometimes in the high schools, but they did not see the newborn micros as a useful supplement to the mainframe, or as an invaluable teaching tool in the first, fifth, or eighth grade classroom. Like Jobs and

Wozniak, a handful of grass roots teachers had this vision. They too were tinkerers. In the beginning, they played with programming, at first, BASIC, then LOGO. They saw some educational value in teaching children about computers and in teaching them how to program. Bits, bytes, algorithms, GOTO, and IF-THEN statements had significance. The vocabulary was important. If you knew it, and how to turn on the computer, boot a disk, and press RETURN, you were computer literate. Before you knew it, you were called a "computer specialist," and you took a few courses to legitimize your new found expertise. Thereafter, all questions about computers in your school, what to buy, how much to pay, where to locate, how to install, and who should have access were referred to you. Your wisdom was sought by other colleagues, parents, the superintendent, and most of all by the principal. In most school systems, educational computing was a sideshow run by a central office "techie" in consort with local school teacher "experts." The whole operation was outside the mainstream of basic education. Superintendents, directors of instruction, principals, and department heads were knowledgeable about reading, writing, and arithmetic; learning styles, effective schools, mastery learning, and a competency based curriculum; but the use of computers, whether in the classroom or the school office, was delegated, (some might say relegated,) to "experts." "Computer education" was an add-on, a supplement, a nice thing to have if you could afford it. Pointing out the computer lab on visitor tours, citing computer-student ratios at the Rotary Club or PTA meetings, or even having a micro visible in your office, were good PR gimmicks when you were trying to impress someone.

A recent anecdote comes to mind. A computer education specialist, I know, was visiting a public school and chatting with the principal in the office about computer related in-service training needs at the school. Not

wishing to appear backward, the principal pointed to an Apple IIe sitting beside the desk and implied that it was used frequently. The consultant smiled, nodded her head, and went on with the conversation. Later she reported that the controller card was sitting on top of a dust covered micro which was not plugged into an electrical outlet. In essence, the Apple was a prop in a play in which the principal played the lead role.

Until recently, this scenario was harmless. The principal did not have to know anything about computers, much less be able to use one. He could rely on his teacher "expert" for computer related decisions. But times have changed. Several things have happened which dictate the need for new knowledge and a new role for the principal as an educational leader in the information age. Perhaps we can group these phenomena under four headings:

1. Teacher knowledge and skills
2. Declining costs and increased computer availablilty
3. Better software
4. A sharper view of the microcomputer as a teaching tool.

Just as Jobs' garage grew into a two billion dollar multinational corporation, the number and expertise of computer-using teachers multiplied like a rabbit warren. Teachers taught teachers, who taught more teachers. The Boston Computer Society, the nation's largest User Group, grew from a membership of 1,000 in 1980 to 18,000 in 1985. Computer using educators in local school districts and states sprang up everywhere. California's CUE (Computer Using Educators) has a membership of 9.000. Florida's FAEDS (Florida Association for Educational Data Systems) will host over 3,000 people at its Orlando conference in January. MECC (Minnesota Educational Computing Cooperative) is a national producer of educational software. Many other less populous states are not far behind. More and more are not only

computer literate, they see computers like textbooks and blackboards, as essential tools for effective teaching, not AV aids like films and slide projectors. Viewing images, although extremely useful, is passive. Learning with a computer is active, indeed, interactive. Children and adults learn by doing. Interacting with a computer is a "doing" process. Teachers, like their students, participate as players, not spectators viewing from the sidelines.

Teacher involvement with computers has been stimulated by colleagues and parents, but mostly by students themselves. Atari, Intel, and Radio Shack attracted children to video games in arcades and in the living room. Thus the computer in the classroom was merely an extension of what children did for recreation outside of school. Teachers were following student leads. Now principals need to follow teacher leads. They need to exercise some constructive control over a large and hungry flock.

As teachers have developed greater, and I should add, more discriminating appetites for computer hardware and software, the cost of acquiring same has come down. Improved manufacturing techniques coupled with fierce competition have cut the price of an Apple II in half over the past four years. My single drive, 64K Apple IIe cost $1,995 in 1983. Today you can buy a 128K Apple IIc for $795 or less. As indicated earlier, TELOSCHOOL was released for $500. The current price is $150. Often friends consult me on the purchase of a computer. My first advice is don't rush. The price of automobiles increases every year, but the price of computers, like VCR's, is still falling. (Unfortunately the value of the stock is doing the same.) Procrastination in purchaseing a computer can be advantageous, as long as you don't use it as an excuse to stay out of the water altogether.

Although not in accordance with the original projections, sales of

personal computers have doubled each of the last four years. Increased availability drives software development and the sales market. The more computers in use, the more potential software sales. Simultaneously, the greater competition among software manufacturers the better the products.

In the early days when only techies or the adventurous owned computers, practically anyone who could write a program could sell it. Cottage industries sprang up overnight. Computer owners were hungry for food to feed their machines. But that era is past. Buyers have become more discriminating. A good piece of software must not only perform a function, it must do it fast and well, and be easy to use -- "user friendly" they call it. Unless the program does something faster, better, and easier than a non-computerized process, it is not worth buying.

The net result from these market conditions is better software. Although there is still much room for new and better software, excellent programs for both classroom and administrative purposes are NOW available. But one must know where and how to find them, and how to use the software once it's been purchased. A principal is not expected to recite a list of good titles, but he/she should be able to advise teachers about criteria significant in judging software and sources of information about it.

The fourth phenomenon which dictates a new role for the principal is the current computer maturity of many teachers. As indicated previously, many teachers no longer see the computer as an object to be taught. They see it as a tool which contributes significantly to effective teaching. Whether using the Muppet Key Board for teaching the alphabet and simple counting, Bank Street Writer or PFS Write for word processing in language arts classes, or PFS File as a database in social studies, the computer enables students to learn new skills, knowledge, and concepts better, faster, and far more

efficiently. Immediate reward rather than delayed gratification for the young child, relief from the tedium of rewriting for the junior high schooler, and access to hitherto unobtainable information for the high school junior and senior add dimensions to teaching and learning which did not exist previously.

Two logical questions follow:

1. What specifically should the principal know about computers?
2. Why?

The answer to the first is relatively easy. It can be expressed in the form of a list:

Hardware: makes, capacities, costs, servicability, availability, useful life expectancy, potential suppliers, etc. What can it do, for whom, and how much? What software is available for it NOW, not promised for tomorrow?

Software: Where do you find it? How do you evaluate it? How will it contribute to the educational goals of the classroom or the administrative function of this office?

I realize these lists are somewhat general. Let me take one very specific example of a situation which calls for a minimal level of knowledge of both computer hardware and software. A new teacher coming from another school puts in a requisition for Story Tree, a very popular program published by Scholastic Software. Although not really into computers, you know that Scholastic is a reputable company, and you have heard that Story Tree can be a very useful tool in teaching writing skills to upper elementary grade students. The school version of the program sells for $75 for the Apple II series, i.e., Apple II Plus, Apple IIe, and Apple IIc. You have an Apple lab in your school which was purchased

three years ago. You approve the requisition.

The program arrives, and the teacher rushes to the computer lab to try it out. It won't load (play). She's upset and brings her tale of woe to you. We all know the rest of the scenario. You fight through the paperwork, return the program, and hope your budget gets credited with the $75. You have been assured, of course, that the disk was defective, since the teacher tried it on several different computers in the lab.

While doing the paperwork you reread the catalogue description of Story Tree. One line says: "Apple II's, 64K, School Version, $75." No wonder it won't load. Your Apple II pluses are 48K. This program requires 64K. But, Whether you know that "K" stands for kilobyte (1,000 bytes) is not important it is important that you know that a 64K program won't load into a 48K machine. It is also important to know that all of your 48K Apple II plus computers can be upgraded to 64K with $75 expansion cards. As you glance over the page of the catalogue, you note that two other programs, Story Maker and Groliers' Playwriter Series also require 64K. Writing Adventure and Note Card Maker require only 48K.

The point is obvious. The principal should know enough about hardware to know that a 64K program won't play on a 48K machine. He/she should also know that a 48K machine is not obsolete. It can be expanded easily to 64K. The principal should also know that the best software is calling for higher capacity computers. PFS Write, for example, the most popular word processing program in the country, requires 128K for the most recent version. The more features built into a software package, the more computer capacity required. This applies particularly to user friendliness, help screens, and the availability of tutorials. All of us laymen want maximum user friendliness in our computer programs. Speed is not that important. Hence we want to

buy computers with at least 128K for elementary school and office work. The fact that they are 8 bit instead of 16 bit machines is not important to us NOW because this relates only to the speed of the internal operations and not to the amount of useful information the program will provide.

This is but one example of how a little knowledge of hardware and software can be useful to the principal.

The principal must also know something about computer advertising, for both hardware and software. Listen to this description. "Teachers Friend was developed by Educators for Educators. It's a proven and effective tool for teaching English to students who can read at the second grade level... Each lesson uses an interesting format of personal, direct, and natural language. And this non-threatening, student-controlled text is immediately followed by a 12-item non-punitive self-correcting drill and practice reinforcement session."

"Students do not have to know how to type. . . Also, because its lessons can be used independently of one another, a student can go right to the lesson he needs, when he needs it."

All of this for $999. $1,595 if you want the speech option. The description also says in parentheses, "(When ordering, specify your preference by adding to each order number A2 for Apple II or TR for TRS-800III)" (a vintage Radio Shack computer).

Now we are not talking about $75. The range is $1,000 to $1,600, plus mailing and handling -- a sizable purchase in any school. In this case it is imperative that the principal know several things:

1. All computer advertising, hardware and software, grossly overstates the capabilities and value of the product. (Notwithstanding Charlie Chaplin's antics.)

2. Try out all computer hardware and software before you buy it to be sure it will do what you expect it to do.
3. Be sure the software matches your computer.
4. Be sure the teacher ordering software has seen it, tried it out, and, most importantly, knows where it fits in your curriculum and in her specific lesson plans.

The list could go on and on. There are books on the subject in your local book or computer store, and the trade journals are full of useful articles and software reviews.

Which leads to another must for principals. Read at least one computer education journal regularly. A general computing magazine and a computer-specific trade journal are also helpful. I would suggest The School Microcomputing Bulletin, InfoWorld, and, for Apple users, A+. There are dozens of others on the racks in any good stationery or drugstore.

Your perusal of the magazines will help in several ways:

1. Keep you informed about what's new or coming soon, in hardware, software and peripherals.
2. Keep you abreast of price changes. They come rapidly in this industry, usually downward.
3. Keep you alert to models, makes, and companies that may be going out of business. The IBM PCjr is a good example. The machines are still good, but obviously software producers are not going to develop products for discontinued merchandise.
4. Provide in-depth reviews of new programs and peripherals. Good reviews are absolutely essential in selecting software, but not the final word. A good review should trigger further investigation. Personal commentary from users whose judgment

you trust is the best criteria for decision making about both hardware and software.

5. Provide cards for you to circle items on which you wish additional information.

The benefits derived from good trade magazines are well worth the price. But be more sceptical about purchasing books about computers and computing. Many are obsolete when they hit the bookstore, and some weren't good when they were written. Some machine or program specific paperbacks can be extremely useful, however, since the industry has been slow to recognize the need for well written, illustrated manuals and documentation. The Minute Manual for PFS is a good illustration. Although the PFS series documentation is far better than most, this little $12.95 paperback can save you hours of searching, especially after you have "indexed" it like this.

Enough about books, magazines, hardware, software, and a glimpse of WHAT you should know about computers. Now some illustrations of WHY you should know it. I have already cited one--budgeting and purchasing. The principal should know at least as much about computers as he/she does about school busses, typewriters, driver ed cars, home economics lab equipment, classroom furniture, and textbooks. Moreover, the principal should know something about the use and abuse of computers in schools. He should know that they aren't magic machines, but he should also know that using a good computer-based SAT prep program can improve a student's combined score by over 100 points. Expensive Stanley Kaplan courses don't do any better.

The principal must recognize word processing as a wonder tool in the hands of both the students and his/her secretary. John Henry Martin, who is speaking at this meeting, can cite data on how computers help students learn to read better and faster. My secretary, if she were here, would attest to

what a word processor did for this speech or for the dozens of letters of recommendation she mails out monthly for aspiring principals who are seeking better jobs. She would also tell you how a spread sheet, in our office Visicalc, saves countless hours in producing accurate monthly budget statements. Mailing labels for specific constituencies are another major time saver. I alluded to that when I spoke of TELOSCHOOL. It gives you student and parent labels as a byproduct of student records.

One might rationalize and say, "This is all fine, but I delegate all the items you've listed." I would then ask, "Do you delegate the function of educational leadership for your school?" Some principals do, to an assistant principal, an aggressive teacher, a counselor, a school secretary, or a bright, articulate, initiatory member of the school board or PTA. Others allow the superintendent or someone from his/her office to provide the real educational leadership for the school, while the principal handles busses, lunches, and discipline. Some are beginning to let the "computer expert" or the "computer committee" make significant educational decisions which are the primary responsibility of the principal.

No one expects the principal to be an expert in everything. The job calls for a jack of all trades and, hopefully, a master of at least one--teaching. But principals must be sufficiently knowledgeable about all school activities and functions to support and assist the people who have particular expertise in any one area, including custodians, secretaries, cafeteria workers, counselors, and teachers--even those who are computer "experts." If the principal refuses to gain this minimal knowledge of computers in education, he/she may become the tail of the dog.

In July, Computer Update, the bi-monthly magazine of the Boston Computer Society, (an organization you should all join if you are not already a

member), printed my article entitled "Computers and Comfortability." The article spoke to the need for teachers to feel comfortable, secure with their computers. That was only four months ago. In some respects it is already out of date. Many teachers, if not the majority, already feel comfortable with computers. The next article will address the topic of how and why principals should feel comfortable with their computers, because I do believe that six months to a year from now most good principals will have a computer either in the office or at home, or both. VCR's interrupted the progress of the computer revolution, but they have not displaced it.